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- further comprising a liquid component;
  - (b) continuously compacting the fluid diffusion layer and liquid-containing electrocatalyst composition applied thereto by applying pressure from at least one compaction roller; and
  - (c) drying the substrate and the electrocatalyst composition applied thereto.

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Claim 12 has been cancelled as duplicative in view of the incorporation into its base claim 1 (and also into independent method claim 16) of the limitation recited in former claim 12.

#### REMARKS

Claims 1-11 and 13-20 remain pending in the present application, claim 12 having been cancelled as duplicative in view of the incorporation into its base independent method claim 1 (and also into independent method claim 16) of the limitation recited in former claim 12.

In the January 9, 2003 Office Action, claims 1-4 and 6-20 were rejected under 35 U.S.C. §103(a) for obviousness in view of Song et al. U.S. Patent No. 5,935,643 or, alternatively, Breault et al. U.S. Patent No. 5,732,463, the latter of which was cited in the applicants' Information Disclosure Statement submitted on August 31, 2001. In the applicants' claimed continuous method

for preparing a fluid diffusion layer, a loading composition, which contains a liquid component and a loading material (an electrocatalyst in independent claim 16), is continuously applied to a substrate. The substrate and liquid-containing loading composition are then continuously compacted by applying pressure from one or more compaction rollers. The substrate and applied loading composition are then dried. Applicants' claimed method thus involves the continuous application of a wet (that is, liquid-containing) loading composition to a substrate and roller compacting the substrate and applied loading composition while still wet. In this regard, the substrate and applied loading composition to be roller compacted can be partially, but not totally dry, in the applicants' claimed method. In other words, the applicants' claimed method is distinguished from conventional, prior art methods, including those described in the references of record, in that the loaded substrate is at least partially wet when roller compacted. As set forth in the applicants' specification, roller compacting a loaded substrate that is at least partially wet is advantageous in that:

To obtain a smoother product, the substrate and loading composition may be partially dried before compaction, preferably to remove about 40% or less of the moisture of the loading composition.

(Specification at page 17, line 27 - page 18, line 1).

As to the rejection of claims 1-4 and 6-20 for obviousness in view of Song, the Song patent describes a method of preparing an electrode for phosphate electrolyte fuel cells. Song's preparation method involves drying the electrode for one day in air followed by drying in an inert atmosphere of 200-250°C for 30 minutes (see Song at column 3, lines 41-45). Song performs these two drying steps after the electrocatalyst layer has been applied to the electrode support, and before the electrode is passed through two compaction rollers. Song explicitly states that his electrode substrate is dried "to completely remove the solvent" (abstract; see also column 3, lines 45-47 ("The drying temperature makes the solvent completely dried while the inert atmosphere prevents the platinum of the catalyst layer from being oxidized.")). Song nowhere discloses or suggests that the electrode substrate should, or even could, be partially wet when being passed through the compaction rollers, as recited in each of the applicants' claims. In fact, Song teaches away from the applicants' claimed method in that Song completely dries the loaded substrate before passing the substrate through the compaction rollers.

As to the rejection of claims 1-4 and 6-20 for obviousness in view of Breault, the Breault patent describes a method of

applying a catalytic material to the surface of an electrode substrate in which a vacuum is employed to deposit the catalyst to the electrode substrate before the substrate is passed through a compaction step, then a sintering step, and then a second compaction step (column 3, lines 39-44). Breault explicitly states that the catalyst loading material is "dried and stored until it is ready to be applied to the substrate" (column 2, lines 28-29). Breault also describes his loading material as being a "powder" that is applied to substrate 26 before compacting in rollers 40 and 42 (column 3, lines 45-51). Like Song, Breault nowhere discloses or suggests that his electrode substrate should, or even could, be partially wet when being passed through the compaction rollers, as recited in each of the applicants' claims. In fact, like Song, Breault's disclosure teaches away from the applicants' claimed method in that Breault applies a dry powder to the substrate before roller compacting.

Claim 5 was rejected in the January 9, 2003 Office Action for obviousness in view of the combination of Song or Breault with Campbell et al. U.S. Patent No. 5,863,673. Like Song and Breault, Campbell, which describes pretreating a substrate with a hydrophobic polymer, nowhere discloses or suggests that the electrode substrate should, or even could, be partially wet when

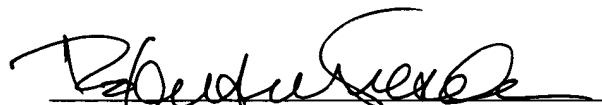
being passed through the compaction rollers, as recited in each of the applicants' claims. Applicants therefore submit that the combination of Campbell with either or both of Song and Breault cannot render the applicants' claim 5 unpatentable for obviousness.

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In view of the foregoing amendments and remarks, applicants submit that claims 1-11 and 13-20 are allowable. The Examiner is invited to telephone the applicants' undersigned attorney at (312) 775-8123 if any unresolved matters remain.

A Petition for One-Month Extension of Time accompanies this Amendment and Request for Reconsideration, along with the requisite fee for extension within the first month. Please charge any additional fees, and credit any overpayment, incurred in connection with this submission to Deposit Account No. 13-0017.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'Robert W. Fieseler', is written over a horizontal line.

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Registered Representative

Robert W. Fieseler  
Signature

4-11-03  
Date of Signature

ATTACHMENT A

MARKED-UP VERSION SHOWING AMENDMENTS MADE

Claims 1 and 16 have been amended as follows:

1. (Amended once) A continuous method for preparing a fluid diffusion layer comprising a substrate and at least one loading material adhered to the substrate, wherein the at least one loading material is adhered to the substrate by the steps of:

- (a) continuously applying a loading composition comprising the at least one loading material to the substrate, the loading composition further comprising a liquid component;
- (b) continuously compacting the substrate and [the loading material] liquid-containing loading composition applied thereto by applying pressure from at least one compaction roller; and
- (c) drying the substrate and the loading composition applied thereto.

16. (Amended once) A continuous method for preparing a fluid diffusion electrode comprising a fluid diffusion layer and at least one electrocatalyst adhered to the fluid diffusion layer, wherein the at least one electrocatalyst is adhered to the fluid

diffusion layer by the steps of:

- (a) continuously applying an electrocatalyst composition comprising the at least one electrocatalyst to the fluid diffusion layer, the electrocatalyst composition further comprising a liquid component;
- (b) continuously compacting the fluid diffusion layer and [the] liquid-containing electrocatalyst composition applied thereto by applying pressure from at least one compaction roller; and
- (c) drying the substrate and the electrocatalyst composition applied thereto.

Claim 12 has been cancelled as duplicative in view of the incorporation into its base claim 1 (and also into independent method claim 16) of the limitation recited in former claim 12.